PUBLIC VERSION

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BEFORE
THE OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE
WASHINGTON, D.C.

IN THE MATTER OF STEEL	)	**SECTION 201 INVESTIGATION**

EXHIBITS
TO
EXCLUSION REQUEST FOR GALFAN COATED STEEL FLAT PRODUCTS
ON BEHALF OF
RAUTARUUKKI OYJ

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November 13, 2001

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INDEX OF EXHIBITS

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EXCLUSION REQUEST FOR GALFAN COATED STEEL FLAT PRODUCTS
ON
BEHALF OF RAUTARUUKKI OYJ

SECTION 201 INVESTIGATION: STEEL

EXHIBIT A

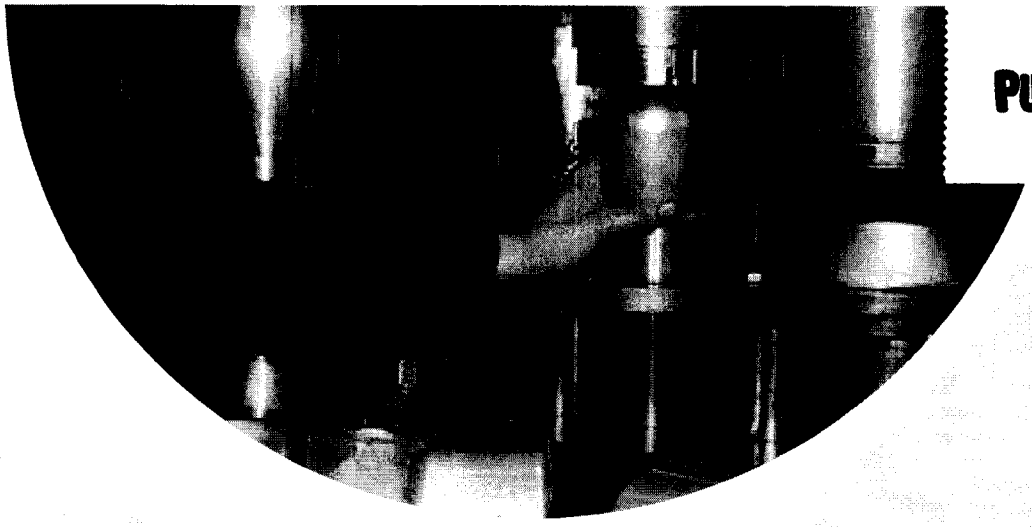
PUBLIC VERSION

RAGAL® GALFAN

ZINC-ALUMINIUM COATED STEEL SHEET

RAUTARUUKKI
STEEL

PUBLIC VERSION

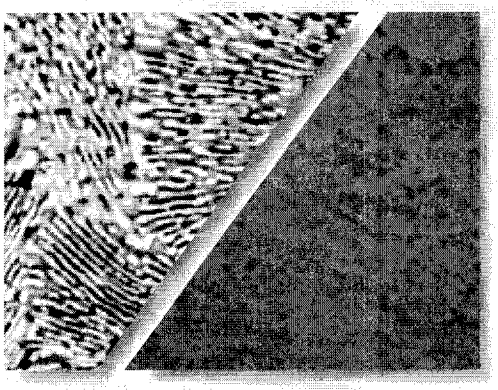


RAGAL® GALFAN

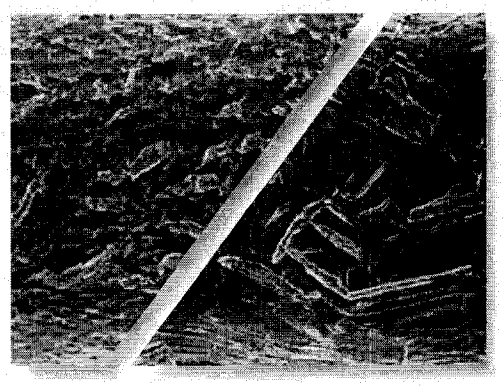
RAGAL GALFAN is the product name of Rautaruukki's zinc-aluminium coated steel sheet. The coating consists of 95 % zinc and approximately 5 % aluminium. RAGAL GALFAN steel sheet fulfils the requirements of standard EN 10214.

Zinc coating is the most general form of corrosion protection for steel sheet. The excellent corrosion resistance of zinc can be even further improved by aluminium alloying. In addition to good corrosion resistance, the composition of Galfan provides a special microstructure offering better formability compared to that of conventional hot-dip zinc coating.

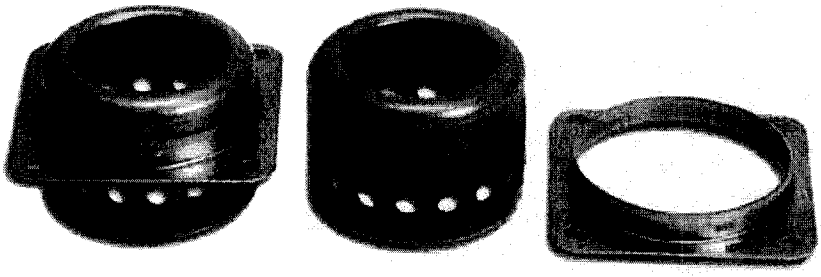
Because of the high zinc content of Galfan coating, it provides the same sacrificial protection as hot-dip zinc for cut edges and scratches.

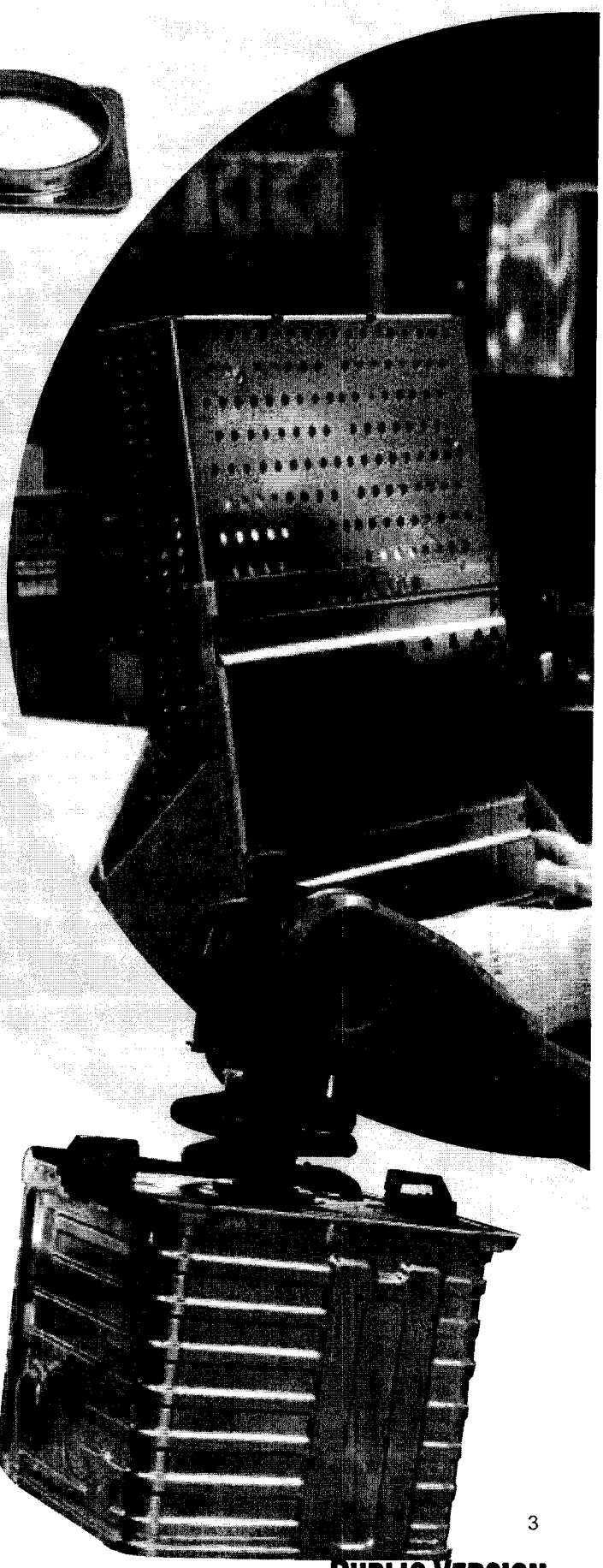


Microstructure of Galfan/hot-dip zinc coating



Coating surface of Galfan/hot-dip zinc coating after bending test





RAGAL GALFAN is corrosion resistant

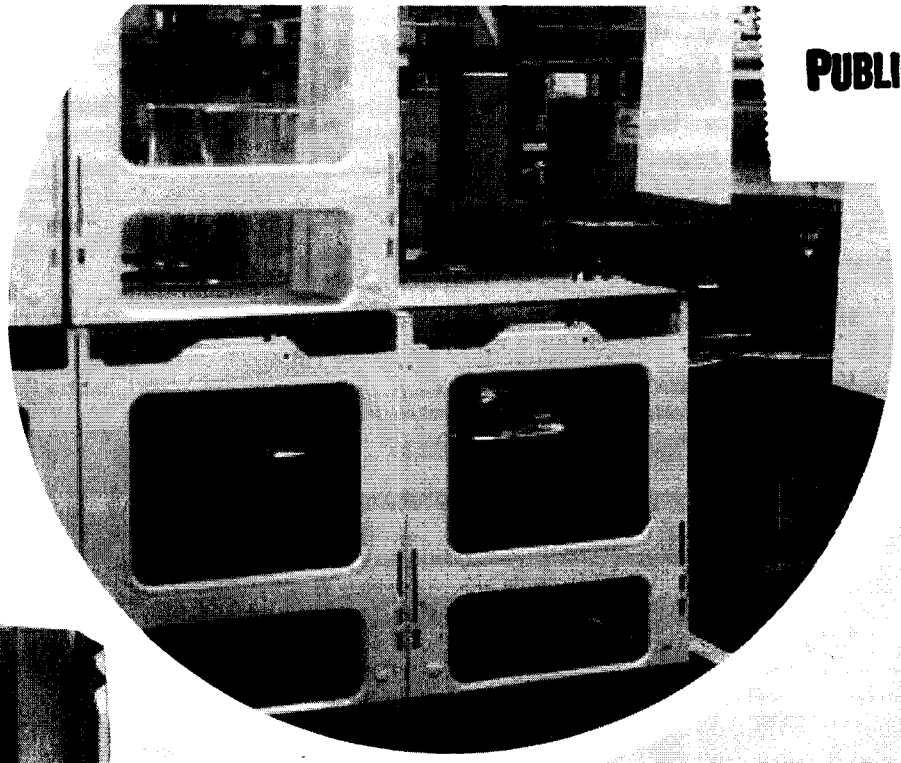
The coating's aluminium content gives unpainted Galfan even better corrosion resistance under varying atmospheric conditions than conventional hot-dip galvanized steel strip. Furthermore, depending on environmental conditions, a dense dull grey oxide layer forms on the metallic shiny matt light grey Galfan surface protecting the coating against further corrosion.

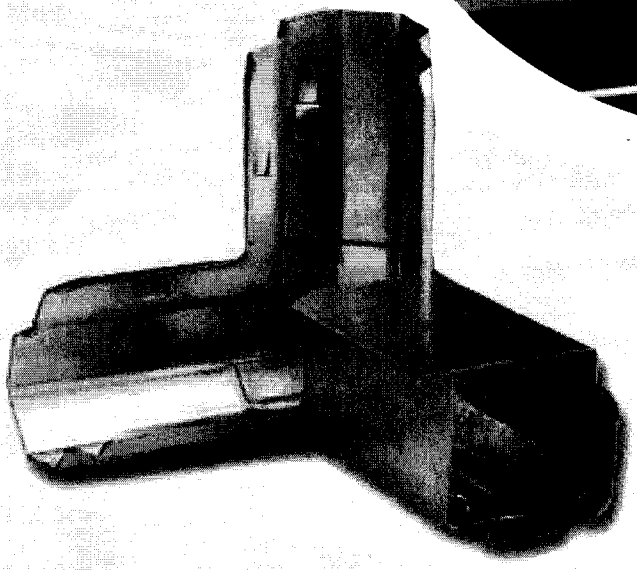
The 5 % aluminium alloying does not reduce the sacrificial protection of the coating at cut edges and scratches. Protection ability is as good as that of hot-dip galvanized sheet being directly proportional to the thickness of the coating.

RAGAL GALFAN is formable

The 5 % aluminium content corresponds to eutectic composition. During crystallization the Galfan coating adopts a lamella microstructure which is very ductile. Thus, even the most rigorous forming operations can be performed without any visible cracking or adhesion problems.

Galfan can be formed using any of the conventional processes applied for steel sheet if its special characteristics are taken into account and parameters adjusted accordingly.





resistance. Moreover, prepainted material can be formed without spoiling the finish.

RAGAL GALFAN is paintable

Unpainted Galfan gives good atmospheric corrosion resistance. However, if extra protection is required, Galfan accepts all conventional pre-treatments and paint systems employed for hot-dip galvanized coatings.

When forming prepainted Galfan, the ductile metallic coating does not propagate cracks to topcoat. Thus, the bends of prepainted Galfan show good corrosion

RAGAL GALFAN is joinable

Galfan coated sheet can be joined by using the same welding and mechanical fastening methods as with hot-dip galvanized sheet, taking into account base material and coating thickness.

Normal adhesive systems can be used for Galfan. The adhesive bonding properties of Galfan organically passivated sheet (AFP) are especially good.

Steel grades

Formable steels

Mechanical properties are in accordance with standard EN 10214.

Steel grade		Yield Strength R_e	Tensile Strength R_m	Elongation A_{80}	Bend test 180°
Rautaruukki Steel	EN 10214	Max N/mm²	Max N/mm²	Min %	mandrel diameter [1]
RAGAL 51 F ZA	DX51D+ZA	–	500	22	0a
RAGAL 52 F ZA	DX52D+ZA	300	420	26	0a
RAGAL 53 F ZA	DX53D+ZA	260	380	30	0a
RAGAL 54 F ZA	DX54D+ZA	220	350	36	0a
RAGAL 56 F ZA [2]	–	180	350	39	0a

[1] a = sheet thickness

[2] This grade is supplied by special agreement only.

Structural steels

Mechanical properties are in accordance with standard EN 10214.

Steel grade		Yield Strength R_e	Tensile Strength R_m	Elongation A_{80}	Bend test 180°
Rautaruukki Steel	EN 10214	Min N/mm²	Min N/mm²	Min %	mandrel diameter [1]
RAGAL 220 S ZA	S220GD+ZA	220	300	20	1a
RAGAL 250 S ZA	S250GD+ZA	250	330	19	1a
RAGAL 280 S ZA	S280GD+ZA	280	360	18	2a
RAGAL 320 S ZA	S320GD+ZA	320	390	17	2a
RAGAL 350 S ZA	S350GD+ZA	350	420	16	2a
RAGAL 400 S ZA	–	400	500	12	2a

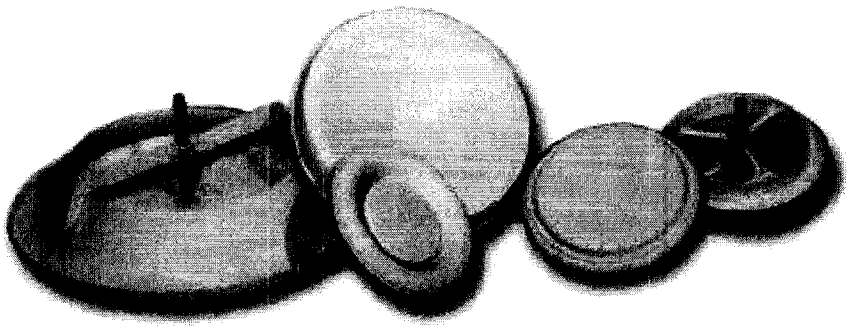
[1] a = sheet thickness

High strength formable steels

Mechanical properties are in accordance with standard EN 10292.

Steel grade		Yield Strength R_e	Tensile Strength R_m	Elongation A_{80}	Bend test 180°
Rautaruukki Steel	EN 10292	N/mm²	N/mm²	Min %	mandrel diameter [1]
RAGAL 260 HSF ZA	H260LAD+ZA	260...330	350...430	26	1a
RAGAL 300 HSF ZA	H300LAD+ZA	300...380	380...480	23	1a
RAGAL 340 HSF ZA	H340LAD+ZA	340...420	410...510	21	1a
RAGAL 380 HSF ZA	H380LAD+ZA	380...480	440...560	19	2a
RAGAL 420 HSF ZA	H420LAD+ZA	420...520	470...590	17	2a

[1] a = sheet thickness



Coating weight, thickness and quality

Mass of zinc coating g/m² [1]	Thickness µm [2,3]	Surface quality, Sheet thickness, mm			
		< 1,00	1,01...1,50	1,51...2,00	2,01...3,00
95	(7)	ABC	ABC	ABC	AB
130	(10)	ABC	ABC	ABC	AB
185	(14)	ABC	ABC	AB	A
200	(15)	ABC	AB	AB	A
255	(19)	AB	AB	A	A
300	(23)	AB	A	A	A

[1] g/m² means the total weight of the coating on one square meter of both sides of the sheet.
[2] Coating thickness (µm) is the average calculated from three (g/m²) results, and is for one side of the sheet only.
[3] The figures in brackets are nominal.
Other coating weights can be supplied by special agreement.
Steel grades RAGAL 350 S ZA and stronger or other more alloyed steels are not supplied in coating surface quality C.

Surface protection
A: As coated surface
B: Improved surface
C: Best quality surface

Surface protection
C: Chemically passivated, this treatment is used unless otherwise agreed
O: Oiled
CO: Chemically passivated and oiled
S: Organically passivated AFP (Anti Finger Print)
U: Untreated

The chemically passivated and oiled surface treatment must be removed before painting of sheets.
The organically passivated surface treatment need not be removed before painting.

Dimensions and weights

Dimensional tolerances

Dimensional tolerances are in accordance with standard EN 10143.

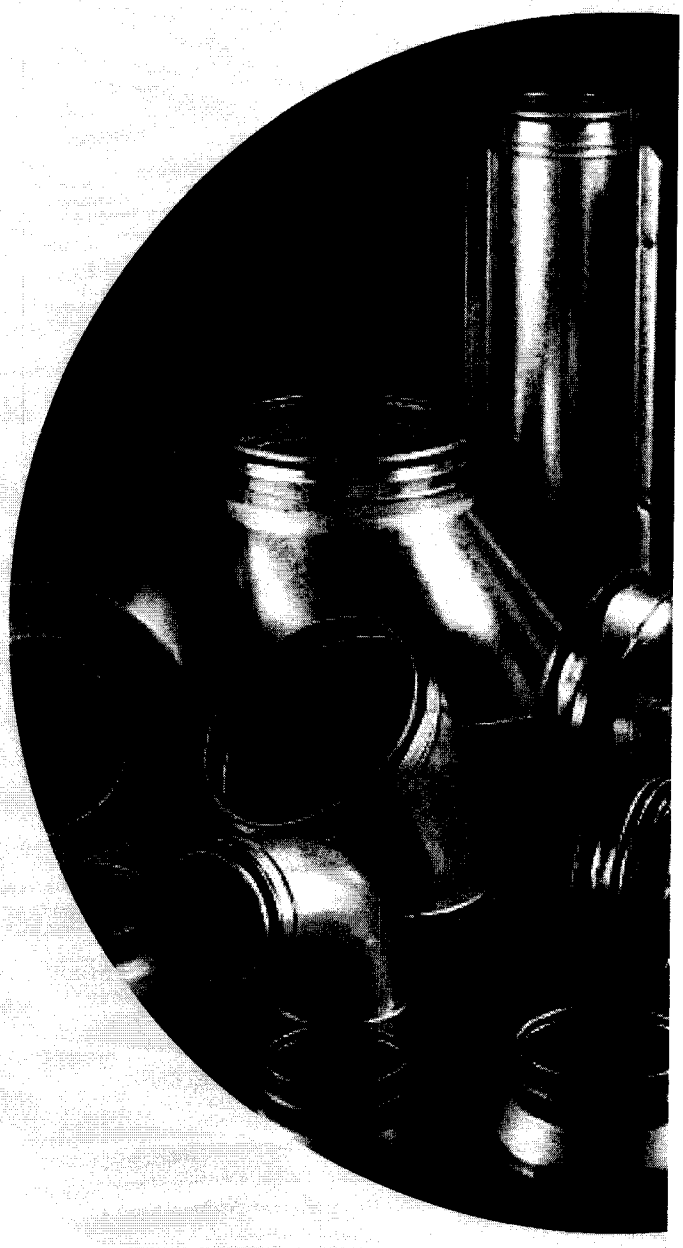
Sheet and strip can be supplied to tighter than standard tolerances by special agreement.

Dimension and weight ranges

	Coils	Slit strips	Sheets
Thickness, mm [1]	0,50...2,50	0,50...2,50	0,50...2,50
Width, mm	1000...1520	50...599	600...1520
Length, mm	-	-	750...6100
Loading weight, kg	2000...20000	-	2000...5000

Coil inner diameter is 508 mm or 610 mm.
Coil outer diameter is a maximum of 2 x coil width, however, 1 900 mm being the absolute maximum.
There are steel grade-specific limits on some dimensions.
[1] The thickness ranges 2,51...3,00 mm, by separate agreement.

Deliveries



Test reports

The supply of a test report, according to standard EN 10204, is agreed upon ordering.

Marking

The back of the sheet is marked with the Rautaruukki logo, for identification, unless otherwise agreed.

Technical information to be supplied with order

Rautaruukki supplies the steel strictly in accordance with the customer's orders. The requirement for manufacture and delivery of the steel is that the customer provides the necessary technical information for the product.

The product must be specified according to Rautaruukki's or some other standard. The standards specify the properties in detail.

When ordering RAGAL GALFAN the following information, at least, is required:

- Steel grade
- Type of coating ZA
- Mass of coating
- Surface quality
- Surface treatment
- Dimensions
- Quantity
- Tolerances
- Package weights
- Type of inspection document

Information

Further information regarding the uses and correct choice of RAGAL GALFAN can be obtained from Rautaruukki Steel Strip Products Marketing.

Following is an example of the product code:

Band RAGAL 53 F ZA DX53D+ZA255 B-C EN 10214:1995

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RAUTARUUKKI
STEEL

Strip Products
FIN-13300 Hämeenlinna
Finland
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www.rautaruukki.com

Printed in Finland by KOTEVA OY TURKU 2001

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NTH 01/2001

BEFORE THE OFFICE OF THE U.S. TRADE REPRESENTATIVE

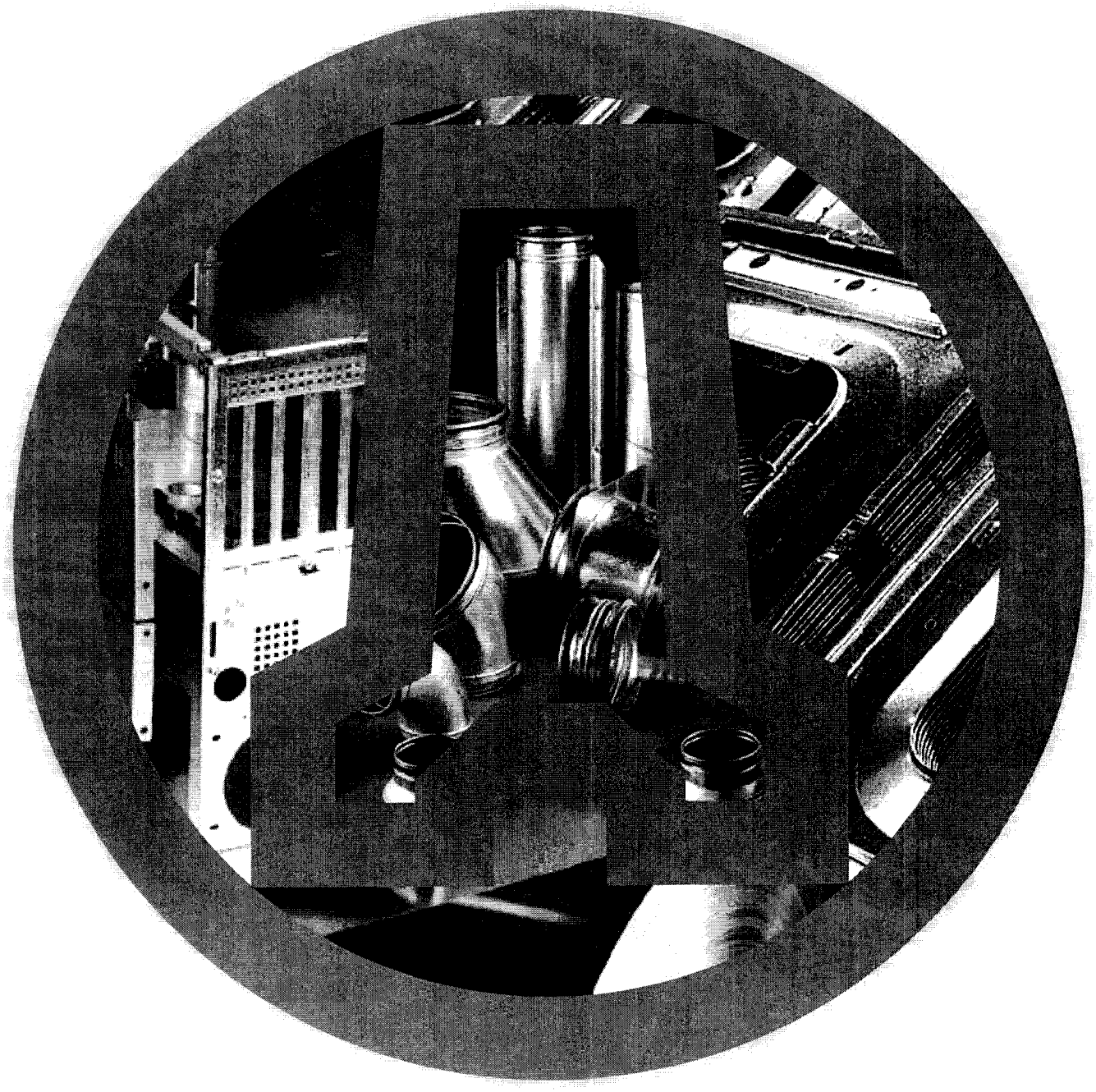
EXCLUSION REQUEST FOR GALFAN COATED STEEL FLAT PRODUCTS
ON
BEHALF OF RAUTARUUKKI OYJ

SECTION 201 INVESTIGATION: STEEL

EXHIBIT B

HOT-DIP ZINC COATED COILS AND SHEETS

PRODUCTION PROGRAM



RAUTARUUKKI
STEEL

PUBLIC VERSION

2. ZINC COATINGS

Hot-dip Zinc Coating (Z)

RAGAL is hot-dip galvanized (Z) steel. The zinc content of the coating is a minimum of 99 %.

The corrosion resistance provided by the zinc coating is in direct proportion to the thickness of the zinc layer. The thickness is chosen taking into account the service life of the product, manufacturing methods and the desired surface quality. Site-painting or coil coating further improves the durability of the product.

Thin zinc coatings are suitable for use in slight corrosive environments. An excellent finish is obtained by using thin coatings. When the quality requirements for the surface finish of the end product are high, thin zinc coatings are recommended.

Medium thick coatings are used for applications in which corrosion is mild. Typical applications are air conditioning equipment and ducts.

Thick zinc coating 350 g/m^2 is recommended for outdoor use unpainted or 275 g/m^2 as coil coated.

It is recommended that thin coatings are used if forming or welding is used in the manufacturing process.

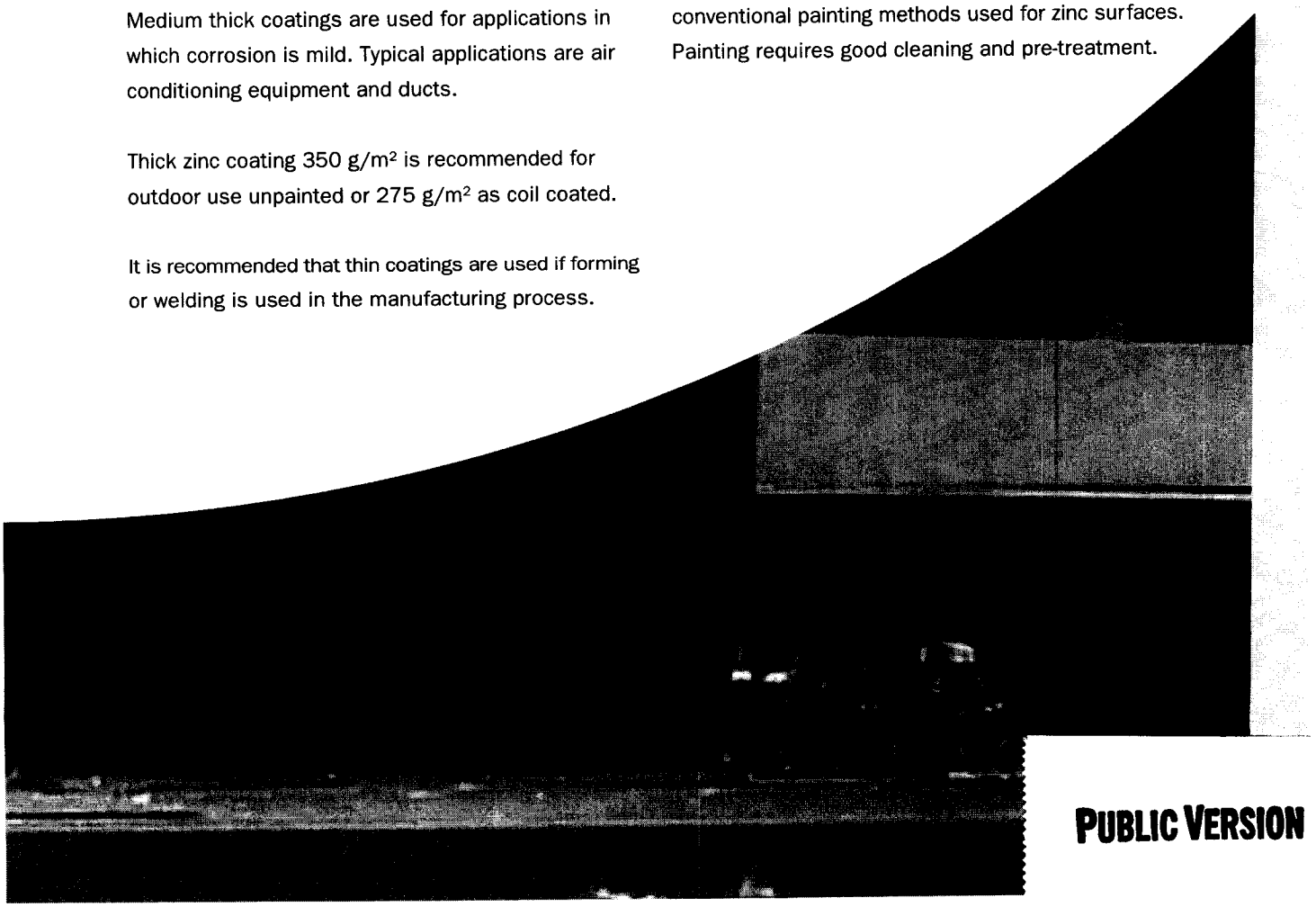
Zinc-aluminium Coating (ZA)

RAGAL GALFAN is zinc-aluminium coated steel. The Galfan coating consists of 95 % zinc and approximately 5 % aluminium. The aluminium alloying provides a microstructure due to which the corrosion resistance and formability of Galfan are better than that of conventional hot-dip zinc coating.

Galfan coated steel is suitable for use in demanding corrosion environments. The cathodic protection of Galfan is as good as that of hot-dip galvanized sheet.

Galfan coating has good formability. Thus, even the most rigorous forming operations can be performed without visible cracking or adhesion problems.

Galfan coating can be painted applying the same conventional painting methods used for zinc surfaces. Painting requires good cleaning and pre-treatment.



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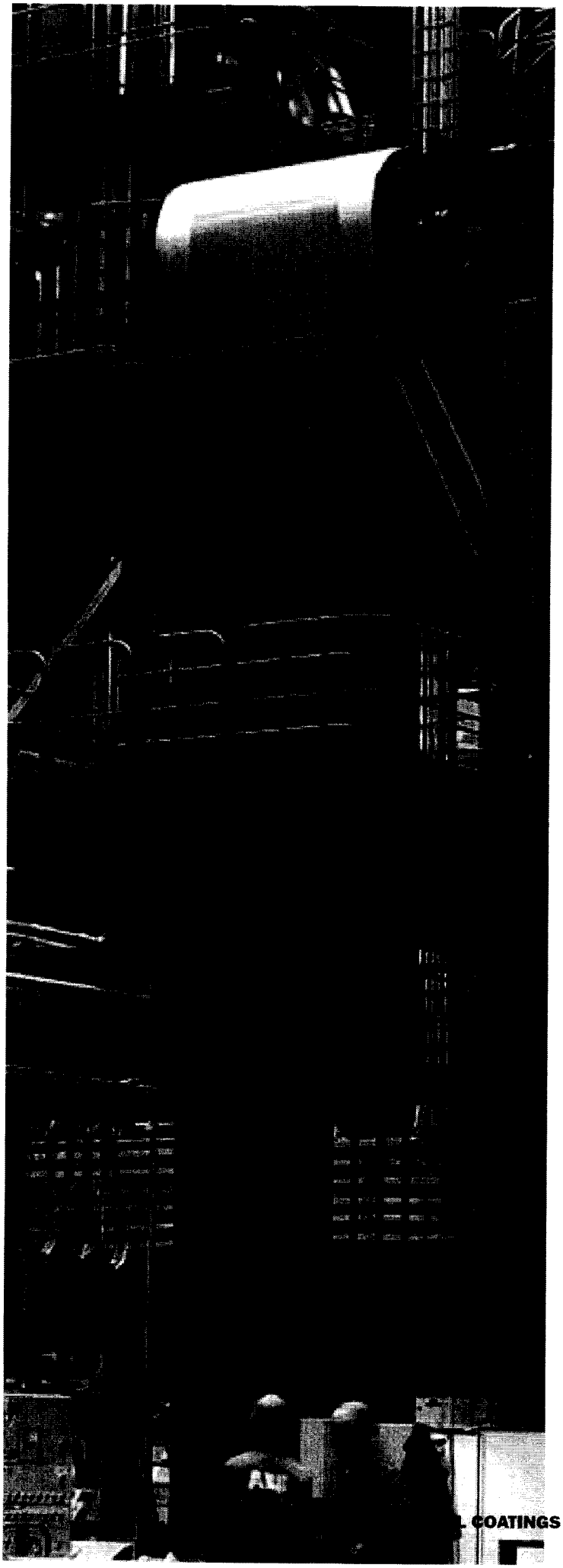

Galfan can be used in the same way as hot-dip zinc coated steel e.g. in resistance welding.

Normal adhesive systems can be used for Galfan. The adhesive bonding properties of organically passivated Galfan (AFP) are especially good.

Galfan is used in automotive, household appliance and the building industry.

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5. RAGAL GALFAN

5.1 Zinc-aluminium Coating (ZA)

RAGAL GALFAN is zinc-aluminium (ZA) coated steel. The Galfan coating consists of 95 % zinc and approximately 5 % aluminium.

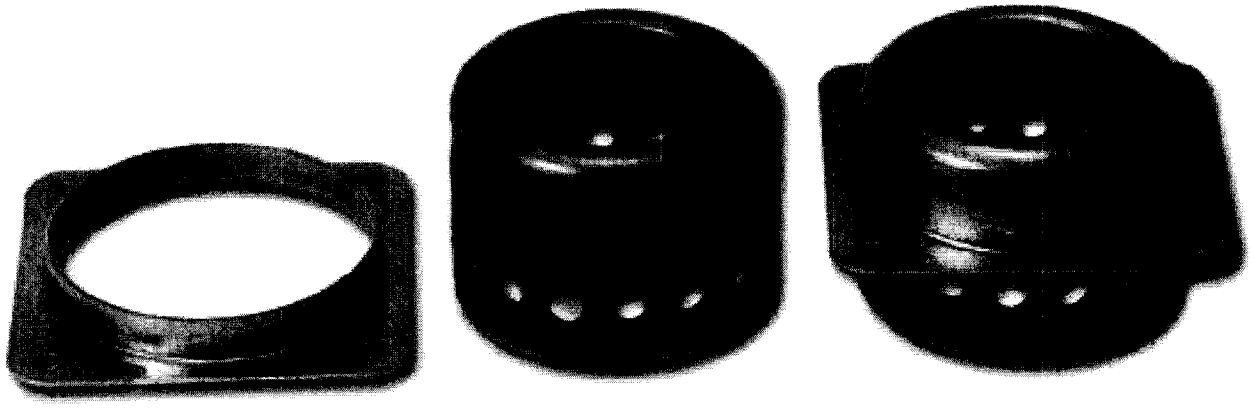
5.1.1 Coating weight

Table 20. Zinc-aluminium (ZA) coating weight.

Coating designation	Minimum weight g/m² [1]		Thickness [2]
	Triple spot test	Single spot test	µm
95	95	80	(7)
130	130	110	(10)
185	185	155	(14)
200	200	170	(15)
255	255	215	(19)
300	300	255	(23)

[1] The coating weight of an area of 1 m² including both surfaces.

[2] Coating thickness (µm) is a guidance value calculated from the triple spot test (g/m²), showing the thickness of zinc coating on one surface.



5.1.2 Surface quality

As coated surface (A): Small unevenness such as variations in spangle size, dark spots, small pits, stripe marks and light passivation stains are permissible. Stretch levelling breaks or zinc run-off marks may appear.

Improved surface (B): Surface quality B is obtained by skin passing. With this surface quality, small imperfections such as stretch levelling breaks, skin pass marks, scratches, indentations, spangle structure and zinc run-off marks and light passivation marks are permissible.

Best quality surface (C): Surface quality C is obtained by skin passing. The better surface does not noticeably impair the uniform appearance of a high-class paint finish. The other surface has at least the characteristics of surface quality B.

Table 21. Zinc-aluminium (ZA) coating weights and surface quality.

Weight of coating g/m²	Surface quality Strip thickness, mm			
	< 1.00	1.01...1.50	1.51...2.00	2.01...3.00
95	ABC	ABC	ABC	AB
130	ABC	ABC	ABC	AB
185	ABC	ABC	AB	A
200	ABC	AB	AB	A
255	AB	AB	A	A
300	AB	A	A	A

Steel grade RAGAL 350 S ZA and higher strength and more alloyed steels are not produced with class C surface quality.

5.1.3 Surface protection

- Unless otherwise agreed at the time of ordering, the coated surface is protected against the formation of white rust by chemical passivation, designation C.
- By request, oil protection can be used, designation O.
- By request, chemical passivation and oil protection can be used together, designation CO.
- The surface can alternatively be protected by organic passivation, AFP (Anti Finger Print), in which the surface is treated with a polymer film containing corrosion inhibitors, designation S.
- By request, can material be supplied unprotected, at the customers own responsibility, designation U.

PUBLIC VERSION

5.2 RAGAL GALFAN Formable Steels

Zinc-aluminium (ZA) coated formable steels are supplied in grades to EN 10214:1995, designated as shown in the table 22.

Table 22. Standard designations.

Rautaruukki Steel		Standard definition
RAGAL 51 F ZA	Bending and profiling quality	DX51D+ZA
RAGAL 52 F ZA	Drawing quality	DX52D+ZA
RAGAL 53 F ZA	Deep drawing quality	DX53D+ZA
RAGAL 54 F ZA	Special deep drawing quality	DX54D+ZA
RAGAL 56 F ZA [1)]	Extra deep drawing quality	–

[1)] Steel grade RAGAL 56 F ZA is supplied by special agreement only.

5.2.1 Mechanical properties

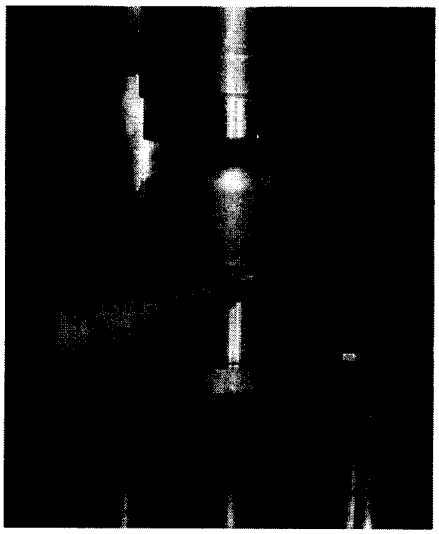
Table 23. Mechanical properties.

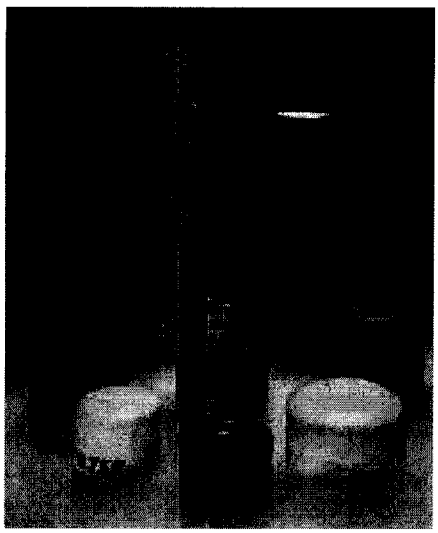
Steel grade	Yield strength R_e max. N/mm^2	Tensile strength R_m max. N/mm^2	Elongation A_{80} min. %	Bend test 180° Mandrel diameter [1)]
RAGAL 51 F ZA	–	500	22	0a
RAGAL 52 F ZA	300	420	26	0a
RAGAL 53 F ZA	260	380	30	0a
RAGAL 54 F ZA	220	350	36	0a
RAGAL 56 F ZA [2)]	180	350	39	0a

[1)] a = strip thickness

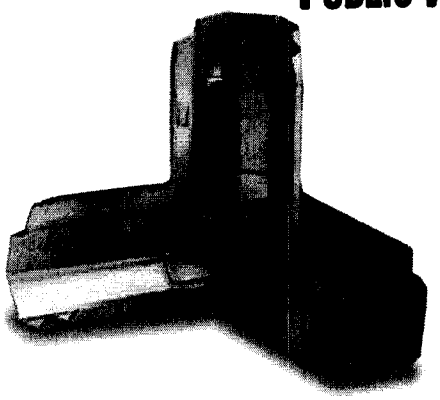
[2)] Steel grade RAGAL 56 F ZA is supplied by special agreement only.

The tensile test values apply to transverse samples.





5.2.2 Dimensions and weights



Dimensional tolerances

Dimensional tolerances are in accordance with EN 10143:1993.
Other tolerances can be agreed on request.

Dimension and weight ranges

Table 24. Dimension and weight ranges.

	Coils	Sheets	Slit strip
Thickness, mm [1]	0.50...2.50	0.50...2.50	0.50...2.50
Width, mm	1000...1520	1000...1520	50...599
Length, mm	-	750...6100	-
Package weight, kg	2000...20000	2000...5000	-

[1] Thicknesses 2.51...3.00 mm can be supplied by agreement.
There are also some grade-specific limitations on dimensions.
Coil inside diameter is 508 mm or 610 mm.
The maximum outside diameter of the coil is 2 x coil width, the absolute maximum being, however, 1900 mm.

Thickness and width ranges of individual steel grades

Table 25. Thickness and width ranges.

Thickness, mm	RAGAL 51 F ZA 52 F ZA Width, mm	RAGAL 53 F ZA Width, mm	RAGAL 54 F ZA 56 F ZA [2] Width, mm
0.50...0.59	1000...1300	–	–
0.60...0.64	1000...1400	1000...1460	1000...1460
0.65...2.00	1000...1520	1000...1520	1000...1520
2.01...2.40	1000...1520	1000...1520	–
2.41...2.50	1000...1500	1000...1500	–
2.51...2.60 [1]	1000...1440	1000...1440	–
2.61...2.70 [1]	1000...1380	1000...1380	–
2.71...2.80 [1]	1000...1340	1000...1340	–
2.81...2.90 [1]	1000...1290	1000...1290	–
2.91...3.00 [1]	1000...1250	1000...1250	–

[1] Thicknesses 2,51...3,00 mm can be supplied by agreement.
[2] Steel grade RAGAL 56 F ZA is supplied by special agreement only.
When ordering sheets or coils with cut edges the maximum width is 15 mm less than that shown in the table.

5.4 RAGAL GALFAN High Strength Formable Steels

Zinc-aluminium (ZA) coated high strength formable steels are supplied in grades to EN 10292:2000, designated as shown in the table 30.

Table 30. Standard designations.

Rautaruukki Steel	Standard definition
RAGAL 260 HSF ZA	H260LAD+ZA
RAGAL 300 HSF ZA	H300LAD+ZA
RAGAL 340 HSF ZA	H340LAD+ZA
RAGAL 380 HSF ZA	H380LAD+ZA
RAGAL 420 HSF ZA	H420LAD+ZA

5.4.1 Mechanical properties

Table 31. Mechanical properties.

Steel grade	Yield strength R_e N/mm²	Tensile strength R_m N/mm²	Elongation A_{80} min. %	Bend test 180° Mandrel diameter [1)]
RAGAL 260 HSF ZA	260...330	350...430	26	1a
RAGAL 300 HSF ZA	300...380	380...480	23	1a
RAGAL 340 HSF ZA	340...420	410...510	21	1a
RAGAL 380 HSF ZA	380...480	440...560	19	2a
RAGAL 420 HSF ZA	420...520	470...590	17	2a

[1)] a = strip thickness
The tensile test values apply to transverse samples.

5.4.2 Dimensions and weights

Dimensional tolerances

Dimensional tolerances are in accordance with EN 10143:1993.
Other tolerances can be agreed on request.

Dimension and weight ranges

Table 32. Dimension and weight ranges.

	Coils	Sheets	Slit strip
Thickness, mm [1]	0.50...2.50	0.50...2.50	0.50...2.50
Width, mm	1000...1520	1000...1520	50...599
Length, mm	–	750...6100	–
Package weight, kg	2000...20000	2000...5000	–

[1] Thicknesses 2.51...3.00 mm can be supplied by agreement.
There are some grade-specific limitations on dimensions.
Coil inside diameter is 508 mm or 610 mm
The maximum outside diameter of the coil is 2 x coil width, the absolute maximum being, however, 1900 mm.

Thickness and width ranges of individual steel grades

Table 33. Thickness and width ranges.

Thickness, mm	RAGAL 280 HSF ZA Width, mm	300 HSF ZA Width, mm	340 HSF ZA Width, mm	380 HSF ZA Width, mm	420 HSF ZA [2] Width, mm
0.50...0.59	1000...1300	1000...1270	1000...1270	1000...1270	–
0.60...0.64	1000...1400	1000...1400	1000...1325	1000...1270	–
0.65...0.79	1000...1520	1000...1400	1000...1325	1000...1270	–
0.80...0.99	1000...1520	1000...1520	1000...1400	1000...1270	1000...1140
1.00...1.29	1000...1520	1000...1520	1000...1400	1000...1400	1000...1240
1.30...1.49	1000...1520	1000...1520	1000...1520	1000...1400	1000...1290
1.50...1.80	1000...1520	1000...1520	1000...1520	1000...1520	1000...1290
1.81...2.00	1000...1520	1000...1520	1000...1520	1000...1310	1000...1290
2.01...2.40	1000...1520	1000...1520	1000...1400	1000...1310	1000...1260
2.41...2.50	1000...1500	1000...1500	1000...1400	1000...1310	1000...1140
2.51...2.60 [1]	1000...1440	1000...1440	1000...1400	1000...1200	1000...1140
2.61...2.70 [1]	1000...1380	1000...1380	1000...1380	1000...1200	1000...1140
2.71...2.80 [1]	1000...1340	1000...1340	1000...1340	1000...1200	1000...1140
2.81...2.90 [1]	1000...1290	1000...1290	1000...1290	1000...1200	1000...1140
2.91...3.00 [1]	1000...1250	1000...1250	1000...1250	1000...1200	1000...1140

[1] Thicknesses 2.51...3.00 mm can be supplied by agreement.
[2] Steel grade RAGAL 420 HSF ZA is supplied by agreement only.
When ordering sheets or coils with cut edges the maximum width is 15 mm less than that shown in the table.

5.5 Coil Weights

Table 34. Minimum and maximum coil weights.

Width, mm	Weight, kg	
	Min.	Max.
600	2100	3900
700	2400	6800
800	2800	10800
900	3100	15800
1000	3500	20000
1100	3800	20000
1200	4200	20000
1250	4300	20000
1300	4500	20000
1400	4900	20000
1500	5200	20000

Certain steel grades and dimensions are subject to special restrictions regarding coils weights.
Minimum weights are approx. 3.5 kg/mm width and the outside diameter of the coil is approx. 1000 mm.
The mill reserves the right to deliver the coils within the following limits:
- Minimum 80 % of the total weight ordered to be coils weighing 80...100 % of the specified maximum coil weight.
- Maximum 20 % of the total weight ordered can be coils weighing 40...80 % of the specified maximum coil weight.

5.6 Delivery Weight (Item weight) for Zinc-aluminium Coated Sheet

The delivery weight (item weight) can be made up of one or more coils.

Delivery weight is made up of at least one coil (16...20 kg/mm coil width) and multiples of this (minimum 28 kg/mm coil width)[redacted]

By special agreement the delivery weight may, in the coil width range 1000...1500 mm, be at minimum 9...11.5 kg/mm coil width or 20...28 kg/mm coil width over the whole width range = yellow areas.

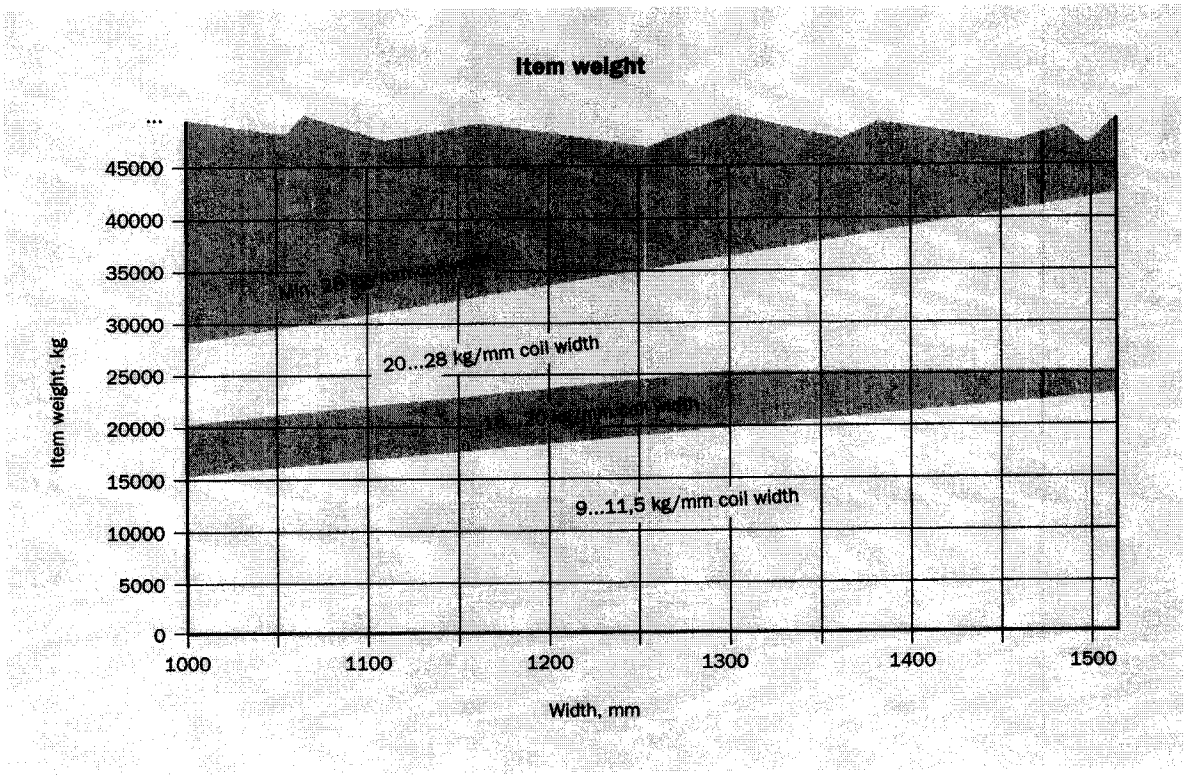
When the coil weight is at least 28 kg/mm width, the manufactured coils are of size 16...20 kg/mm coil width and 9...11.5 kg/mm coil width.

When ordering coils without welding seams the size must be 9...10 kg/mm coil width or multiples of this. By special agreement, however, the coil weight can be 16...20 kg/mm coil width.

The suitability of coil weight can be checked from table.

Table 35. Delivery weight (item weight) according to width and coil weight per mm coil width (kg)

Coil width	Item weight, kg		
	16...20 kg/mm coil width	Min. 28 kg/mm coil width	9...11,5 kg/mm coil width
1000	16000...20000	28000	9000...11400
1050	16800...21000	29400	9400...12000
1100	17600...22000	30800	9900...12600
1150	18400...23000	32200	10300...13200
1200	19200...24000	33600	10800...13800
1250	20000...25000	35000	11200...14400
1300	20800...26000	36400	11700...14900
1350	21600...26000	37800	12100...15500
1400	22400...28000	39200	12600...16100
1450	23200...28000	40600	13000...16600
1500	24000...28000	42000	13500...17100
1520	24320...28000	42560	13600...17500



BEFORE THE OFFICE OF THE U.S. TRADE REPRESENTATIVE

EXCLUSION REQUEST FOR GALFAN COATED STEEL FLAT PRODUCTS
ON
BEHALF OF RAUTARUUKKI OYJ

SECTION 201 INVESTIGATION: STEEL

EXHIBIT C

Galfan Technology Centre, Inc.
University of Pittsburgh Applied Research Center

October 25, 2001

MANUFACTURERS

Active Producing Galfan® Licensees as of Listing April 2001

Listed below are the only Galfan Licensee's that have the facility, and meet the coating manufacturing disciplines, required to provided Galfan coated product that meet the international standards of performance.

SHEET						
Cockerill Sambre S.A	ilris Lecoq	32 4 236 42 17	32 4 236 42 50	iris.lecoq@cockerill-sambre.com	Flemalle	Belguim
Corus Group Plc	Alan Morris	+44 1244 812 345 X2400	+44 1244 892 431		Flintshire	Wales, UK
Fabrique de Fer de Maubeuge (FFM)	Bernard Gailliez	+33 27 64 60 01	+33 27 65 87 70		Louvroil	France
Kawatetsu Galvanizing Co., Ltd.	Namio Suganuma	+81 3 5255 9524	+81 3 5255 9539		Tokyo	Japan
Kobe Steel, Ltd.	Masaya Nakamura	+81 794 36 1352	81 794 36 1353		Hyogo	Japan
Nisshin Steel Co., Ltd.	Noriyoshi Karashima	+81 3 3216 6250	81 3 3287 2506		Tokyo	Japan
NKK Corporation and NKK Keihin Works	Yoshiyuki Morita	+81 44 322 1079	+81 44 322 1547		Kawasaki	Japan
Puyat Steel Corporation	Salvio Perez	+632 634 0060	+632 631 5228		Metro Manila	Philippines
Rautaruukki Oy	Dr. Arto Ranta-Eskola	+358 3 528 5467	358 3 528 5620	arto.ranta-Eskola@rautaruukki.fi	Hameenlinna	Finland
Sollac	Daniele Quantin	+33 3 44 55 74 59	+33 3 44 55 72 80		Montataire	France
Sumitomo Metal Ind., Ltd.	Hisakazu Morino	+81 3 3282 9206	+81 3 3282 6761		Tokyo	Japan
Thyssen Krupp Stahl AG	H. Heiler	+49 2721 516 100	+49 2721 516 288		Finnentrop	Germany
Voest Alpine Stahl Linz	Franz Ankeri	43 2732 885 205	43 2732 885 715	lohnverzinkung@vakf.at	Linz	Austria
Weirton Steel Corp.	Cynde B. Vidas	800 223 9777	304 797 2267	cynde.vidas@weirton.com	Weirton	West Virginia
Yieh-Phui Enterprise Co. Ltd.	C.C. Wang	88 6 (7) 3 611-9883	88 6 (7) 612 1316	yiehphui@ksts.seed.met.tu	Taiwan	R.O.C.
Yodogawa Steel Works	I. Tsurumura	011 81 6 6245 1119	+81 6 6282 9176		Osaka	Japan

WHY GALFAN?

Performance Characteristics of Coated Steel Products

Formability -- Measure of the ability of the coating to survive fabrication operations such as bending, roll forming, stamping and deep drawing without cracking, flaking or failure of the coating

Corrosion Resistance (bare) -- Measure of the time the coating can protect the underlying steel and resist red rust corrosion in normally encountered environments. The length of corrosion protection given by zinc coatings depends directly on coating thickness.

Sacrificial Protection -- Ability of the coating to provide galvanic or sacrificial protection to bare steel exposed at cut edges, fastener locations, scratches, etc in normally encountered environments. Aluminized and Galvalume coatings provide good extended sacrificial protection only in salt environments when the aluminum becomes sacrificially active.

Formed Product Corrosion Resistance -- Ability of fabricated products containing sharp bends and deep drawn sections to resist corrosion.

Paint Adhesion -- Ability of the coating to be painted using a wide variety of pretreatment, primer and top coat systems and to maintain good adhesion during product fabrication and use.

Painted Product Corrosion Resistance -- Ability of the commercial coil coated product to protect the base steel from red rust including blistering, edge creep corrosion and red rust staining.

Weldability -- Ability of the coated steel to be spot welded on a continuing basis with good welding electrode life.

Reflectivity/Heat Resistance -- Measure of relative brightness and heat oxidation resistance upon exposure to elevated temperatures.

Cost -- Relative Production cost of material per ton.

How Does Galfan Compare? 5 = Best 1 = Worst	Galfan	Hot Dip Galvanized	Electrogalvanized	Galvanneal	Galvalume	Aluminized	Zincrometal
Formability	5	3	5	3	3	2	5
Corrosion Resistance (bare)	4	3	3	2	5	5	2
Sacrificial Protection	5	5	5	5	3	1	2
Corrosion Resistance (formed)	5	3	3	3	3	2	2
Paint Adhesion	5	4	5	5	4	2	5
Corrosion Resistance (painted)	5	4	4	5	3	3	2
Weldability	3	4	5	5	2	1	2
Heat Resistance/Reflectivity	3	3	3	2	4	5	1
Relative Cost	3	4	2	4	3	3	5

Galfan is a new generation coating for steel that both improves product performance and significantly expands manufacturing capabilities.
Containing 95% zinc and 5% aluminum/mischmetal, Galfan provides a unique combination of coating benefits including:

- Maximum Formability
- Increased Corrosion Protection
- Full Sacrificial Protection
- Improved Paintability
- Good Weldability
- Broad Versatility
- Excellent Surface Smoothness

Is Galfan the coating for your application? The Table above will help you make a decision. It charts how Galfan stacks up to other coated steels commonly available. The coated products are rated on a relative basis, considering normal performance levels in each category.

Where has Galfan proved successful? The list includes a variety of applications in such industries as:

- Construction
- Pre-Engineered Metal Buildings
- Fencing
- Agriculture
- Automotive
- Appliance
- Industry Equipment

The comparison above is intended to provide general guidance to users for applications in a broad range of industries. Specific properties of a particular material should be determined by contact with the supplier of that coated steel product. All of the products are rated as normally supplied and used.

SHEET

Four main categories of Benefits

1. Coating Properties
2. Easy Process Management
3. Economics
4. Access to innovative applications for zinc coated steel sheet in various sectors:

Building & Construction

- Cladding, Roofing, Partition Wall, Ceiling, Doors
- Steel Framing for Residential House, Window frame
- Snow guard, nail board,spriral-ducting

Automotive

- Motor Housings, Oil Filters, Cover of shock-absorber, Alternator plate

Appliances

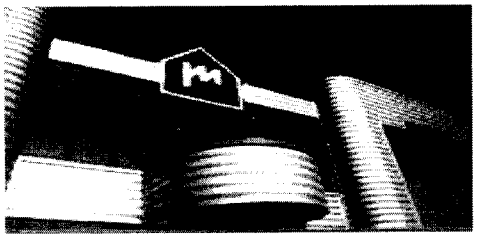
- Washing machine Frame & Panels, Cooker plate
- Industrial dryer drum
- Speaker support

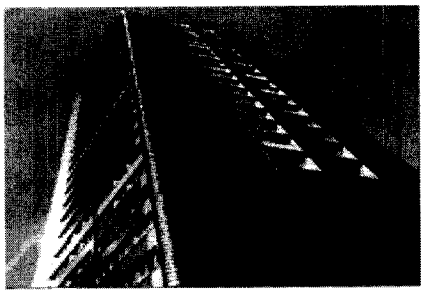
Industrial

- Gasoline Pump, Tanks
- Heat exchanger, Ventilator housing
- Trapezoidal profiles, Cable tray

Application Examples:

Cladding





DRIVERS	RATING
Corrosion	5
Formability	5
Paintability	5
Appearance	3
Economics	4
New Application	3